وزارة الاتصـــالات
وتكنولوجيا المعلومات
MINISTRY OF TELECOM & INFORMATION TECHNOLOGY

Digital West Bank and Gaza Project

(DWBG)

Project ID: P174355

E- Waste Management Plan

Prepared by: MTIT Project Management Unit (PMU)

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Contents

1. Introduction

The Digital West Bank and Gaza (DWBG) project, being implemented by the Ministry of Telecommunication and Information Technology (MTIT), will seek to produce concrete and tangible results for the Palestinians through (a) increase access to high-speed broadband services, (b) boost digital response, recovery, and resilience from shocks, such as Coronavirus (COVID-19), and (c) increase access to selected E-government services.

The project, which is funded by the World Bank, is designed to reflect environmental and social considerations as required by national laws and regulations such as the Palestinian Environmental Law, the Palestinian Health Law, and the Palestinian Labor Law. Additionally, the project is guided by the World Bank's Environmental and Social Framework (ESF), and its Environmental and Social Standards (ESSs). As such and based on the ESF requirements for project proponents (i.e., MTIT), and as required under the applicable ESSs to the project, an Environmental and Social Management Framework[1] has been prepared for the project which details the expected environmental and social potential impacts, proposed mitigation measures, screening methodology, and applicable ESSs among others.

Electric and Electronic Waste, or E-waste, is an informal name for electrical and electronic products nearing the end of their "useful life." Computers, televisions, stereos, copiers, and fax machines are common electronic products. For this project such waste can include servers, modems, computers, monitors, and other electronic devices. Many of these products can be reused, refurbished, or recycled. However, electronic discards are one of the fastest growing segments of the Palestinian waste stream[2].

Out of the identified potential environmental and social risks in the ESMF is the generation and management of E-waste which requires its own E-waste Management Plan (E-WMP). Therefore, this E-waste Management Plan shall serve as a guidance document for MTIT and its Project Management Unit (PMU) to meet the challenges for providing a safe, environmentally sound, and unified response for E-waste management. The goal of the E-waste Management Plan is to protect human health and the environment while complying with applicable local regulatory requirements.

This plan involves the tracking of E-waste resulting or associated with the activities of the DWBG Project from the point of generation through its final disposition. MTIT and the project

[1] https://documents1.worldbank.org/curated/en/149331615214881212/pdf/Environmental-and-Social-Management-Framework-ESMF-Digital-West-Bank-amp-Gaza-P174355.pdf

[2]Final Report on The Development of a National Master Plan for Hazardous Waste Management for the Palestinian National Authority: https://environment.pna.ps/ar/files/Part_one_Final_Report_on_The_Development_of_a_National_Master_Plan_for_Hazardous_Waste_Management_for_the_Palestinian_National_Authority_en.pdf

stakeholders shall avoid the generation of e-waste where possible and adopt the (4 Rs) principle; Reduce, Reuse, Recycle and Recover. Where waste generation cannot be avoided, the project shall minimize the generation of waste, and reuse, recycle and recover waste in a manner that is safe for human health and the environment. Where waste cannot be reused, recycled, or recovered, e-waste shall be treated, destroyed, or disposed of in an environmentally sound and safe manner that includes the appropriate control of emissions and residues resulting from the handling and processing of the waste material. All Project Workers[3] involved in any waste management process must read and have a thorough knowledge of the procedures contained within this guidance document.

2. Relevant Laws and Legislations

The Palestinian Environmental Law (PEL) - 1999

The PEL does not include specific clauses for the definition and management requirements of E-waste. According to the definition of hazardous waste in the PEL, E-waste is hazardous waste. Hence, all aspects addressed in the legal and institutional framework of hazardous waste applies to the E-Waste. There are no special articles on E-waste[4].

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal

Palestine have joined the Basel Convention in April 2015; the Basel convention aims to reduce hazardous waste generation and to promote environmentally sound management of hazardous wastes despite the place of disposal. Additionally, the Basel convention provisions the restriction of transboundary movements of hazardous wastes except where it is perceived to be in accordance with the principles of environmentally sound management. The convention provides a regulatory system applying to cases where transboundary movements are permissible.

Palestinian Cabinet Decree on the Management of Hazardous Waste – No. 6, 2021

The decree sets the basis for the management and treatment of hazardous waste, it imposes licensing and environmental approval procedures for hazardous waste management facilities and activities. The decree sets forward the storage, segregation, and treatment requirements for hazardous waste. The decree additionally defines the requirements for the transportation of hazardous waste, and in line with the Basel Convention, prohibits the export or import of hazardous waste without obtaining the proper permits under specified conditions.

[3] ESS2: Labor and Working Conditions, Paragraphs 3-8: https://thedocs.worldbank.org/en/doc/837721522762050108-0290022018/original/ESFFramework.pdf#page=45&zoom=80

[4] Country Report on the Solid Waste Management in Occupied Palestinian Territories, April 2014: http://environment.pna.ps/ar/files/Country%20report%20on%20the%20solid%20waste%20management.pdf

Palestinian Cabinet Decree on Adopting the General Policy for the Disposal and Treatment of Electronic Waste – June 2021 (02/113)

This decree sets the requirements for the management and disposal of e-waste generated from governmental and public institutions and provides the definition of e-waste as hazardous waste. The decree sets forward the collection, storage, transportation, auctioning, and disposal requirements.

This decree defines the e-waste management required from MTIT, and other ministries and public institutions for the e-waste generated from their operations. As it is the main policy targeting e-waste management, its requirements have been incorporated in this project specific E-waste Management Plan, and a further description of the decree is provided in chapter 5.

World Bank ESS3: Resource Efficiency and Pollution Prevention and Management

ESS3 contains provisions on the management of hazardous and non-hazardous wastes under section B. It sets the borrowers' requirements under World Bank funded projects to minimize the generation of waste, reuse, recycling, and recovery of waste in a safe manner. If the aforementioned is not possible at all or in part, ESS3 requires borrowers to dispose of the waste in an appropriate manner that include control of emissions and residues resulting from the handling and disposal process of the waste material. ESS3 requires that if the generated waste is considered hazardous, the borrower shall comply with the existing requirements for management in line with national requirements, international conventions and (Good International Industry Practices (GIIP).

World Bank Environmental, Health, and Safety (EHS) Guidelines – General EHS Guidelines[5]

The EHS guidelines define hazardous waste as one sharing the properties of hazardous material (e.g., ignitability, corrosively, reactivity, etc.…) among other physical, chemical, or biological characteristics that may pose potential health risks. Hazardous waste in terms of this document are ones that are also classified as "hazardous" by local regulations. The EHS guidelines define the practices required from facilities that generate and store waste which include avoidance and minimization, and where waste generation cannot be avoided but has been minimized, recovering and reusing waste, and where this cannot be implemented, reusing, treating, destroying and disposing of it in an environmentally sound manner. The EHS guidelines contain specific measures for the management of hazardous waste that include compliance with local and international regulations, ensuring contracting reputable and legitimate enterprises for the management of hazardous waste. In addition to general waste management measures on waste prevention, reuse, recycling, treatment, disposal, storage, transportation, and monitoring.

[5] https://documents1.worldbank.org/curated/en/157871484635724258/pdf/112110-WP-Final-General-EHS-Guidelines.pdf

3. Project Related E-Waste Sources

Mainly under components 2 and 3 of the DWBG Project, infrastructure and connectivity activities including the upgrade, fitting of new, or replacing electrical and electronic equipment for the Emergency Response Center and the post offices with upgraded broadband services which could result in the generation of e-waste. As such, the activities under the project's components could include the generation of e-waste consisting of servers, computers, routers, and cabling, among others. The following table includes the types and estimated amounts of e-waste that could result from the implementation of the project activities, as well as the new electric & electronic equipment that will be procured through the project, which at their End-of-Life Cycle could become e-waste.

Component	*Sub-Component*	*Activity*	*Expected Types of E-waste Associated with the Implementation of the Sub-component*	*Expected types of Electric / Electronic Equipment to be procured throughout the Sub-component*	*Expected Volumes*
Component 1: Enabling Legal and Regulatory Environment for Digital Economy	1.1- Strengthening development of key institutions of digital economy	The Establishment of the Telecom Regulatory Authority (TRA) and the purchase of equipment, hardware, and	None	Laptops: ~ 30 PCs: ~ 20 Monitors: ~50 Printers: ~10	LAPTOPS: 0.33 m x 0.25 m x 0.02 m = 0.001650 m^3 / laptop 30 * 0.00165 m^3 = 0.05 m^3

		software solutions		Mouse + Keyboard: ~50 Projector: ~2	PC (Mid-tower standard ATX) 0.2m x 0.45m x 0.45m = ~0.04 m^3 20 PC x 0.04 = 0.8 m^3 MONITORS: ~24 inch = 0.54 x 0.3 x 0.02 m = 0.00324 m^3 0.00324 m^3 x 50 = 0.16 m^3 PRINTERS: 0.55 x 0.55 x 0.4 m = 0.12 m^3 10 x 0.12 m^3 = 1.2 m^3 MOUSE:

					Standard: ~0.1 x 0.06 x 0.02 m = 0.00012 m^3 50 mice x 0.00012 m^3 = 0.006 m^3 KEYBOARD: ~0.15 x 0.45 x 0.02 m = 0.00135 m^3 50 keyboards x 0.00135 m^3 = ~0.07 m^3 PROJECTORS: 0.3 x0.2 x0.1 = 0.006 m^3 2 x 0.006 m^3= 0.012 m^3
Component 2: Digital Infrastructure Solutions for Emergency	2.1- Emergency Response Center (ERC) for Resilience.	Technical Assistance (TA) and preparation for the procurement of	None	PCs: ~20 Monitors: ~20	PC (Mid-tower standard ATX)

Response, Recovery and Resilience		communications equipment and software		Headsets: ~ 20 Servers: ~2 physical servers (16 cores each + 32 RAM +1 TB SSD) + ~100 TB Storage Printers: ~ 4	0.2m x 0.45 x 0.45 = ~0.04 m^3 20 PC x 0.04 = 0.8 m^3 MONITORS: ~24 inch = 0.54 x 0.3 x 0.02 m = 0.00324 m^3 0.00324 m^3 x 20 = 0.065 m^3 SERVERS: 2 * (1.8 x 1 x 0.8 m) = ~3m^3 PRINTERS: 4 x 0.12 m^3 = 0.5 m^3
	2.2- Expanding Access to Broadband Connectivity through Sustainable Maximizing Finance for	Purchase of broadband services in collaboration with telecom operators and	Routers: ~ 97 router replacement Cables: ~ 1000 meters	Routers: ~97 router Cables: ~ 1000 meter	ROUTERS: ~0.2 x 0.1 x 0,03 m = 0.0004 m^3

	Development (MFD) Approach	Internet Service Providers (ISPs).			97 x 0.0004 m^3 = ~0.4 m^3 CABLES: ~1000 m
	2.3- Expanding connectivity through the development of fiber optic infrastructure	Upgrade the existing digital infrastructure to fiber optic infrastructure.	The plan will be updated to reflect potential e-waste generation under this subcomponent when its activities are determined.	This is to be determined throughout the implementation of the project. The plan will be accordingly updated.	
Component 3: Fostering User Centered e-Service Delivery	3.2- Delivering user-centric e-Services	Purchase of equipment, software, and licenses.	1. Expansion of data centres which might result in E-waste generation. No replacement will take place, only upgrade 2. Digital Access Points (DAPs), equipping Post Offices with electronic equipment, new equipment	1. Servers: ~10 (4 TB RAM, 324 TB Storage, 1420 VCore.) 2. ~ 50 Post Offices to be transformed to DAPs: - PCs - Monitors - Mouse - Keyboard	1. Each estimated to be 0.8x1x1.8 m (for each rack) = 1.44 m^3 each server = 10 x 1.44 = 14.4 m^3 2. DAPS:

				- Printers	PCs: 50 x ~0.04 m^3 = 2 m^3 Monitors: 0.00324 m^3 x 50 = 0.16 m^3 Mouse: 0.006 m^3 Keyboards: 0.07 m^3 Printers: 0.12 m^3 x 50 = 6 m^3
	3.3- Development and implementation of priority e-GP functionalities in targeted high-spending agencies	Upgrading of existing hardware	The physical server's capacity required for the development of the E-Government Procurement (e-GP) system is included in 3.2.		

4. Potential Environmental and Social Impacts

The following are the potential environmental risks that could arise from the generation of e-waste.

- Generation of leachate and the release of pollutants and heavy metals to the environment due to unsafe and improper disposal of generated e-waste, posing health and safety risks to the public.
- Contamination and acidification of agricultural soil, affecting soil fertility and agricultural yield.
- Water, air, and soil pollution due to the release of environmental pollutants such as Persistent, Bio-accumulative Pollutants (PBT), and Persistent Organic Pollutants (POPs), furans, lead, mercury, polybrominated flame retardants, lithium, dioxins, and Polycyclic Aromatic Hydrocarbons (PAHs) among others.
- Improper recycling of e-waste as such practices are done for scavenging resalable components and parts, therefore causing environmental pollution due to the burning of cables, random disposal of wastewater from the recycling processes, and random dumping of irretrievable e-waste.

In addition, improper collection, management, and disposal of e-waste could pose the following health and social risks.

- Nuisance to communities due to aesthetical and visual pollution
- Contamination of drinking water, underground water resources with heavy metals, and other POPs.
- Various health impacts due to heavy metals in water, air, and soil due to the carcinogenic nature of these pollutants and their bioaccumulation in the food chain and water resources.
- Child labor and Gender Based Violence Impacts associated with employing children and women in collection and primitive recycling of e-waste.

5. Palestinian Institutional E-waste Management Practices

MTIT, as with other ministries and public institutes are required to manage their e-waste in accordance with the Palestinian Cabinet Decree on Adopting the General Policy for the Disposal and Treatment of Electronic Waste – June 2021 (02/113). The decree sets the requirements of MTIT and other public institutes for the safe management and disposal of e-waste. It requires that e-waste to be collected and stored at the public institution and to be disposed of only once a year no later than the first quarter of each year.

Auctioning: The decree requires the procurement department at the public institute to announce an auction for the sale of e-waste to companies and institutes that are licenced to manage this type of waste. The law requires companies to provide their license and documentations, and an e-waste management plan in accordance with this decree which includes reuse, recycling, recovery, or re-sale to other internal or external parties.

Collection: The decree sets the requirements for collection, the company that is awarded the auction shall be responsible for the collection of e-waste from the different public institutes within the second quarter of each year, no later than May of the same year, in accordance with the bidding documents.

Transportation: In terms of transportation, the awarded company shall provide safe and adequate vehicles and machinery to transport e-waste in accordance with this decree. The transport destination shall be the transfer stations, treatment facilities, or final disposal locations.

Temporary Storage: e-waste can be stored at the public institute temporarily until it is collected. The temporary storage is to take place in specified and dedicated locations which are authorized by the specialized entities, and which take into regard the occupational health and safety considerations. Companies that are awarded the auction are required to fill the quantity forms that include the type of collected waste from the temporary storage locations.

Treatment and Processing: Treatment or processing of e-waste shall take place at licenced and equipped facilities. Awarded companies or contractors shall specify in their proposals the treatment method that they are to apply. The implemented processes and management methodologies have to be documented and records are to be stored.

Disposal: Disposal methods must be specified in the proposals. The companies applying for the auction shall commit to the safe disposal of e-waste in accordance with national legislations and laws.

Awareness: Each institute is responsible for raising awareness with regard to the safe disposal and management of e-waste.

6. Mitigation Measures and E-waste Management

In accordance with the PEL, the Palestinian Cabinet Decree on the Management of Hazardous Waste, the Palestinian Cabinet Decree on Adopting the General Policy for the Disposal and Treatment of Electronic Waste – June 2021 (02/113), ESS3, World Bank EHS Guidelines, and the ITU End of Life Management for ICT Equipment[6], the following are the general requirements for E-waste management.

1. Waste minimization and prevention
2. Selection of technologies and equipment based on international standards to maximize their lifetime and minimize associated risks at their end-of-life stage
3. Coordination with the relevant authorities and stakeholders
4. Identification, labelling, and segregation of e-waste at source
5. E-waste quantification, and qualitative record keeping
6. Temporary storage on site
7. Collection and transport

[6] https://www.itu.int/dms_pub/itu-t/oth/4B/04/T4B0400000B0013PDFE.pdf

8. Central storage at MTIT designated location
9. Reuse, recycling, and recovery of suitable waste
10. Treatment and disposal
11. Incident reporting of e-waste related accidents

E-waste segregation must take into account the hazardous nature of the waste or its content (e.g., heavy metals, POPs) shall always be segregated from other e-waste that does not contain environmental, carcinogenic, or other pollutants. The segregation shall be done based on content, and correct labelling and quantification must be applied. Annex II presents the e-waste management and monitoring matrix expected to be implemented in relation to the project by MTIT and the contractors engaged in the replacement or retrofitting of ICT equipment.

a. E-waste Minimization and Prevention

The following set of measures aims to prevent and/or minimize the quantities of e-waste generated and the hazards associated with e-waste:

- Procure electronic devices from credible manufactures to avoid purchasing second hand, refurbished, or obsolete devices with a short shelf life or already categorized as e-Waste. In order to achieve this, project related Information and Communication Technologies (ICT) procurement shall be done according to the World Bank procurement procedures and GIIP in the ICT sector.

- Instituting good housekeeping and operating practices, including inventory control to reduce the amount of e-waste resulting from materials that are out-of-date, off specification, contaminated, damaged, or excess to operational needs; and

- Minimizing hazardous e-waste generation by implementing stringent waste segregation to prevent the commingling of non-hazardous and hazardous e-waste to be managed.

- Instituting procurement measures that recognize opportunities to return usable materials.

b. E-waste Segregation and Quantification

The contractors and suppliers associated with the DWBG Project shall be assigned the responsibility of sound e-waste segregation, quantification, and labelling in accordance with this plan, national laws and GIIPs. This in turn will be reinforced in their contracts and their responsibilities towards the e-waste segregation, quantification, and labelling will be clearly stated in the bidding documents.

As such, characterization, segregation, sorting, labelling, quantification, temporary storage and transport to final storage location, this shall be conducted according to composition, source, type of e-waste produced, pollutants content (POP/heavy metals/PAHs/ and others) in accordance with local and GIIP practices, for the list of GIIP Practices applicable to this e-waste management plan, please refer to Annex IV.

c. E-waste Recycling, Reuse, and Recovery

Operational assessment of end-of-life equipment shall be conducted by running appropriate tests to assess the functionality when replacing or retrofitting project related equipment, these tests shall be run by MTIT. A sample of a functionality test that shall be conducted is adapted from the ITU guideline on the End-of-Life Management of ICT Equipment, available in Annex I.

In addition to the implementation of e-waste preventive strategies, the total amount of e-waste may be significantly reduced through reusing utilizable components within the project or by MTIT technical staff, or through outsourcing to certified and licenced firms that shall be contracted to receive project related e-waste.

d. E-waste Storage

MTIT staff and involved contractors shall ensure that the storage of project related e-waste is being conducted in accordance with the national laws and legislations, GIIPs such as the ITU guidelines, and the World Bank EHS Guidelines containing measures on Hazardous Waste, available in annex IV. E-waste shall be stored in a way that prevents and controls accidental release to natural resources (air, soil, and water). The following measures are to be followed in the storage of e-waste.

- Temporary storage containers shall be available on site until transported into their final storage location.
- E-waste shall be stored in closed containers, each depending on type and composition away from direct sunlight, rain, wind, electrical fixtures, water systems and in an area where ventilation system is not circulated to other rooms or facilities.
- E-waste shall be stored in an appropriate manner preventing the mixing or contact between different sorts of e-waste and in a separate location from solid waste.
- The storage arrangement shall allow for inspection between containers to monitor leaks or spills. Examples could include insufficient space between incompatible e-waste.
- The Contractor, employees involved in the e-waste management, and the disposal or recycling enterprises shall provide their personnel with training and induction on the proper handling of e-waste.
- Employees involved with e-waste management shall be provided with the appropriate Personal Protective Equipment (PPEs), vaccinations in accordance with the Health Law and the bylaw on hazardous waste, and a medical record shall be kept.
- Containers with different types of e-waste shall be correctly labelled, with a datasheet attached and specified for each type including but not limited to number of containers, number of units within each container, type, weight, hazardous material content (Lead, mercury, etc…), date of collection, e-waste management personnel name, receiver, and final disposal method.
- Conduct periodic inspection of e-waste storage area and document the findings.

e. E-waste Transportation

All e-waste containers designated for off-site transport shall be secured in the designated storage location and shall be labelled as indicated in section 6.4 with the contents, associated hazards, receiver, destination, and other information. E-waste shall then be properly loaded onto the transport vehicles in accordance with OHS guidelines on loading and unloading, specified in the World Bank EHS Guidelines, ILO guidelines, and other GIIP.

The e-waste containers shall be accompanied by an e-waste transfer note, in the form of a transport manifest that describes the load and its associated hazards, in suitable and well-suited vehicles in accordance with GIIPs. The handler and transporter shall be registered and certified.

f. E-waste Treatment and Disposal

In cases when e-waste is still generated after the implementation of feasible e-waste prevention, reduction, reuse, recovery and recycling measures, e-waste materials should be treated and disposed of, and all measures should be taken to avoid potential impacts to human health and the environment. Selected management approaches include timely removal, treatment and/or disposal at permitted/ approved facilities specially designed to receive the e-waste in accordance with national laws and GIIP.

7. Monitoring

When significant quantities of hazardous e- wastes are generated and stored on site, monitoring activities shall include:

- Weekly visual inspection of all e-waste storage collection and storage areas for evidence of accidental releases and to verify that e-waste is properly labelled and stored.
- Weekly visual inspection of labelling, quantities, and containers conditions.
- Weekly inspection of loss or identification of cracks, corrosion, or damage to protective equipment, or floors.
- Verification of locks, and other safety devices for easy operation (lubricating if required and employing the practice of keeping locks and safety equipment in standby position when the area is not occupied).
- Documenting any changes to the storage facility, and any significant changes in the quantity of materials in storage.
- Regular audits of e-waste segregation and collection practices.
- Tracking of e-waste generation trends by type and amount, preferably by facility departments.

Additionally, record keeping of collected e-waste needs to be monitored. E-waste collected, stored, or transported shall include:

- Name and identification number of the material(s) composing the hazardous e-waste or Physical state.
- Quantity (i.e., kilograms, number of containers)
- Content (i.e., devices, screens, servers)
- Schedule (date of collection, date of transportation, etc…)
- Hazardous and pollutant contents (i.e., existence of mercury, lead, PAHs)
- E-waste transport tracking documentation shall include, quantity and type, date dispatched, date transported, and date received, record of the originator, the receiver, and the transporter.
- Method and date of storing, repacking, treating, or disposing at the facility, cross-referenced
- to specific manifest document (e-waste transfer notes) numbers applicable to the hazardous e-waste, or the Location of each hazardous e-waste within the facility, and the quantity at each location.

8. Budget and Resources Requirements

The table below provides an indicative outline of the cost and resources requirements needed for the implementation of this plan;

Activity	Timeline	Cost
Staff to be hired/assigned by the contractors to implement the E-waste management Plan.	After awarding the contract	4000$
Training to workers on the identification and handling of E-waste, segregation, labelling, filling data sheets, and storage.	Prior to commencement of works	1500$
Providing containers for E-waste collection	Prior to commencement of works	800$
Temporary storage & Transport to final storage location	After finishing each site	1500$ (avg. 15$/ site)
Operational Assessment and Sample Functionality Testing	Upon final Storage at MTIT location	NA (to be conducted by MTIT)
Audits (if needed)	On completion	2000$

Tracking and monitoring	Continuous	No additional cost
SUM		**9800$**

ANNEX I: Sample Functionality Test for Used Computing Equipment

This sample functionality test has been adapted from ITU end-of-life management for ICT equipment[7] and the Basel Convention PACE revised guidelines on environmentally sound material recovery and recycling of end-of-life computing equipment[8].

Computing equipment	Functionality tests	Test results
Central processing units (CPUs), including desk top PCs, routers, and other equipment	**Power on self-test (POST)** Switching on the computer and successfully completing the boot up process. This will confirm that the principal hardware is working, including power supply and hard drive. • A working monitor will need to be used if none present • Ensure that cooling fans are functioning • Remove dust as much as possible (e.g., delicately using a vacuum cleaner is possible), in order to ensure better cooling and stable operation	**Computer** should boot up successfully **Computer** should respond to keyboard and mouse input. **Cooling fans** should operate normally. No strong mechanical sound denoting end-of life of fans.
Cables and power cords	- Assess cable insulation and inspect plugs	Cabling and plugs should be complete and free of damage, e.g., has no cracked insulation. Any detachable cable with damage should be replaced by a new one to avoid electric shocks or premature failures.
Components (removed from equipment) including mother boards, other circuit boards, sound cards, graphics cards, hard drives, power supplies and cords/ cables)	Components should be gently wiped from dust to improve thermal exchange and allow better cooling. Components should be tested for functionality either before removal from the host computer or laptop, or by insertion in a test bench computer using diagnostic software, or a known working device as applicable	Components should be fully functional Power supplies and cords / cables should be complete and free of damage, e.g., has no cracked insulation. Any detachable cable with damage should be replaced by a new one to avoid electric shocks or premature failures.

[7] https://www.itu.int/dms_pub/itu-t/oth/4B/04/T4B0400000B0013PDFE.pdf

[8]http://www.basel.int/Implementation/TechnicalAssistance/Partnerships/PACE/PACEGuidelines,ManualandReports/tabid/3247/Default.aspx

ANNEX II: E-waste Management and Monitoring Matrix

Impact	Mitigation	Monitoring	Responsibility
Air Pollution through improper disposal leads to release of toxic, hazardous, carcinogenic gases. **Air Pollution Through Open-air burning practices & scavenging** Open air burning of e-waste (e.g., cables to extract copper) leads to spread of hazardous fumes through a wide radius	• Procure Electronic devices from credible manufactures to avoid purchasing second hand, refurbished or obsolete devices with a short shelf life or already categorized as e-Waste. Apply WBG Procurement procedures and GIIP. • Instituting good housekeeping and operating practices, including inventory control to reduce the amount of e-waste resulting from materials that are out-of-date, off specification, contaminated, damaged, or excess to operational needs; and • Implement stringent e-waste segregation to prevent the commingling of non-hazardous and hazardous e-waste to be managed. • Identify and recycle some of the ICT products that can be reintroduced into the operational processes.	• Warranty for electronic devices purchased. • Review of procurement evaluation report for the manufacturers suppling the electronic devices. • Availability of E-waste receptacles for collecting e- waste. • Inclusion of e-waste management provisions in contracts. • Inclusion of E&S measures that cover labor, E&S mitigation measures into contracts. • Records of good housekeeping and visual inspection. • Certificate of disposal of E-wastes given by a licensed E-waste firm, stating that E-waste from the project has been successfully disposed of. • awareness campaigns and publications for users of electronic devices on E- waste management. • Assess the contracts and staffing of e-waste contractors to ensure no child labor is employed.	Implemented by the Contractor, MTIT beneficiary departments and units, and Monitored by the E&S Specialist.
Occupational Health and Safety and Human Health impact due to poor disposal Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully.			
Pollution of land resources including landfills Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully.			

Pollution of water bodies Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully.	• Establish E-waste collection centers, including collection bins, receptacles. • Contract a licensed E-waste firm/ or liaise with appropriate authorities for to timely remove E-waste for treatment and / or disposal at permitted facilities. • Ensure that receiving entities or firms are contractually committed to providing their workers with all necessary requirements and provisions in accordance with the LMP, PLL, and ESS2. Additionally, workers need to be aware of the existence of the Workers' GM and are to be provided with orientation. • Conduct awareness for the users of electronic devices to ensure that they engage in best practices for e waste management.		
Growth of informal E- waste disposal centers Improper and indiscriminate disposal of E-waste is likely to lead to the mushrooming of informal waste disposal centers in neighborhoods which further exacerbates the problem of E-waste.			
Labor and Working Conditions scavenging, and primitive unlicensed recycling activities often employ workers without contracts and unsuitable working conditions (wages below minimum wage, extra working hours, delays in payment)			
Gender Based Violence and Child Labor Primitive recycling and scavenging workshops could posses the risk of employing children and/or women who might be subject to abuse, harassment and/or exploitation			

ANNEX III: Inspection Form Template

E-waste Type Generated	Hazardous Content? (Pb, Hg, PAH, …)	Segregated		Stored		Recycled/ Reused/ Recovered		Disposed		Satisfactory	
		Y	N	Y	N	Y	N	Y	N	Y	N

ANNEX IV: Good International Industry Practices Relevant to the Project's E-waste Management Plan

- End-of-Life Management for ICT Equipment, ITU 2012: https://www.itu.int/dms_pub/itu-t/oth/4B/04/T4B0400000B0013PDFE.pdf

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- Palestinian Cabinet Decree on Adopting the General Policy for the Disposal and Treatment of Electronic Waste – June, 2021 (02/113).

- Success Stories on E-waste Management, L Supplement.27, ITU 2016: https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-L.Sup27-201610-I!!PDF-E&type=items

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